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cannot say; but from that quarter where the greatest quantity of the vapour seemed to be in motion, the sound was plainest; and this, during my observation, was the eastern. The scene lasted about half an hour, though the whole night was as light as when the moon is in the quarters."

N° XXII.

A Letter from J. MADISON, Esq. to D. RITTENHOUSE, Esq. containing Experiments and Observations upon what are commonly called the Sweet Springs.

THESE waters rise on the north side of a large mountain at the foot of it, called the Sweet Spring Mountain, in the county of Botetourt. The south side is covered with stones of an ocreous appearance. In many places iron ore may be found; but on the north the mountain is fertile, covered with a rich mould, at least near the spring. The remarkable efficacy of these waters in many disorders, especially, it is said, in consumptive complaints, first induced me to attempt their analysis. Such experiments as I had time and opportunity to make, I shall faithfully relate, and leave it to others, better qualified than myself, to judge of their merits.

Experiment 1. Having plunged a very sensible mercurial thermometer in the spring, it stood at 73°. The temperature of air was about 69.

2. A good hydrometer sunk one-twentieth of an inch deeper in common mountain water, than in the spring.

3. Nut-galls mixed with the water in a wine glass struck a palish brown, which shewed that there was little or no iron in it.

4. Violets mixed with the water in a wine glass, turned

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ed it in a short time of a reddish colour. This was a proof that the waters contained some kind of acid.

5. Having made a solution of silver in the nitrous acid, and mixed a little of it with the water, it immediately became milky, and a white pulvurent precipitate ensued. This experiment shewed by the whiteness of the precipitate, that the waters contained nothing sulphureous, and by the pulvurency of the precipitate that the acid contained in the waters was vitriolic.

6. A solution of lead in the nitrous acid being mixed with the water, it became somewhat milky, and a white precipitate was observed. This experiment also shews that the waters contain an acid, most probably the vitriolic, and also that they contain calcareous earth. Soap is not readily miscible with them.

7. A solution of saccharum saturni in the nitrous acid being made, and lines marked upon paper with it, and placed over the water, the lines retained their former colour. This experiment also shews that the water contains nothing sulphureous.

8. Having poured a little of the spirit of salt into the water, after some time a coloured precipitate was observed, but as the waters did not strike a green or blue colour, it shewed that there was no copper in them.

9. A solution of vitriol of copper mixed with the water produced a thick, green, curdly appearance, but did not become bluer. This experiment shewed that there was no vol. alkali contained in them.

10. The vitriolic acid mixed with the water suddenly effervesced, and produced a heat which raised the thermometer from 75 to 83, by applying the bulb to the outside of the glass.

11. As the spring is continually discharging large bubbles of air, which rising from the bottom break upon the surface of the water, I was desirous of making some experiments upon the air, in order to determine whether the

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the acidity of the water might not be owing to it; and also to determine the nature of the air, whether fixed or not. Having therefore caught a quantity of the air in a decanter, I communicated a part of it to an equal bulk of pure mountain water, and after agitating them for some time, gave it to several to taste; who agreed that it had the taste of the spring water. Upon a second trial this experiment did not succeed. I had not an opportunity of trying the nature of the air by means of chalk-water, and was prevented from prosecuting any farther enquiries into the nature of these celebrated waters by a sudden alarm, to which the frontiers were then continually exposed.

These waters have been falsely called *sweet*, for their taste is evidently acidulous. The experiments also shew that they contain an acid. Their taste resembles exactly that of waters artificially impregnated with fixed air, extricated from chalk, by means of the vitriolic acid, and I conceive must be nearly the same with the true Pyrmont water. They have little or no smell, do not form an incrustation, nor do they leave a deposit upon standing many hours. Upon bathing in the morning, the skin has a soapy kind of feel. This was not observed in the evening.

There is near this spring another, a very strong chalybeate.

I am, with great regard, yours,
J. MADISON.

N° XXIII.

A Letter from the Rev. JEREMY BELKNAP, on the preserving of Parsnips by drying.

Dover, New-Hampshire, March 5, 1784.

Read Apr. 26, 1784. SIR,
AMONG the number of esculent roots, the
parsnip has two singular good qualities.
Cc 2 One